

## **A REVIEW AND UPDATE ON RESEARCH AND THE ACTIVITY OF DOLLAR SPOT ON GOLF COURSES AND LAWNS IN OHIO**

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Dollar spot (*Sclerotinia homoeocarpa*) is considered the number one turf disease in Ohio requiring more fungicide applications to manage than any other turf disease. In recent years many have been increasingly challenged to manage the disease. The following information is to assist in the understanding and management of this disease. Topics included are; an overview of epidemiology, recent weather patterns and impact on disease severity, fungicide label update, and OSU dollar spot fungicide evaluation data.

**Epidemiology** --- Is the study of disease initiation, development, and spread.  
There are many aspects that are unknown or not fully understood.

- Survives unfavorable conditions (overwinters) as dormant mycelium in thatch, excessive thatch significantly enhances the severity of dollar spot problems.
- Pathogen growth initiation starts when temperature reaches 60° F in the turf microenvironment (in the turf canopy).
- Maximum fungal growth occurs at 70° to 80° F in the turf microenvironment.
- Temperature range for fungal growth is 59 – 86° F; there are biotypes in southern USA that tolerate and grow well at higher temperatures.
- Long periods of wet foliage from; dew, fog, high humidity, overcast skies, light rain, guttation fluid, irrigation, etc. provide ideal conditions for pathogen growth.
- The fungus can produce a material during active growth that is toxic to bentgrass roots; this may be associated with the slow recovery of damaged spots.
- Night atmospheric humidity of 85% or higher (heavy dew formation) is ideal.
- Dissemination is by movement of infected plant parts and the mycelium.
- Slow growing turf; due to limited soil moisture, low fertility levels, poor soil conditions, etc. is more severely damaged and the damage persists.
- Soil pH and phosphorous levels are reported to have limited influence on disease severity.
- Turf susceptibility, can occur on all cool season grasses, however bentgrasses and some cultivars of Kentucky bluegrass are often most severely damaged.
- Fungicide resistance is an increasing concern. OSU is studying how wide spread this problem is and ways to determine if resistance has occurred by developing a laboratory test to help turf managers plan the most effective fungicide strategy.

**Weather Conditions** --- Dollar spot severity can be greatly influence by yearly weather patterns.

As outlined in the previous information on epidemiology, environmental conditions /weather, plays a major role in the growth and devolvment of the pathogen. The activity of most turfgrass diseases is determined by the environmental factors of temperature and moisture. The following weather data Table 1 contains the average temperature by month

and notes the departure (+/-) from the normal monthly temperature. Precipitation data is not included since it was extremely variable across the state. In the 2000 season there were many golf course superintendents that found management of dollar spot to be extremely difficult. A major reason for this was the long period of time that weather conditions were almost ideal for the growth of the pathogen *Sclerotinia homoeocarpa*. The spring was warmer than normal which accelerated the growth and development of the pathogen. So disease onset was early and more aggressive than in most years. Then the summer that followed had cooler than normal temperatures, which again was nearly ideal for the pathogen to grow. The high disease activity in the spring, through the summer, and into the fall made 2000 one of the most ideal for continued disease activity. The contrasting situation was the summer of 2002. Spring was warmer than normal or about normal and dollar spot started, but the summer was much warmer than normal and the disease activity dropped off sharply and did not reoccur until well into the fall. Much of the state last summer was quit dry which further reduced dollar spot growth and development, making disease pressure low and easier to manage. In 2001 there was a mixture of high and low temperatures and the activity of the disease was variable.

**Table 1. Weather Data  
The Ohio State University /OSU Turfgrass Research Center  
Columbus, Ohio**

	<b>2000 Avg. Temp.</b>	<b>2001 Avg. Temp.</b>	<b>2002 Avg. Temp.</b>	<b>Normal Avg. Temp.</b>
<b>April 1-30</b>	51.7 (+ 0.6)	56.5 (+ 5.4)	54.5 (+ 3.4)	51.1
<b>May 1-31</b>	65.7 (+ 4.3)	63.3 (+ 1.9)	59.0 (- 2.4)	61.4
<b>June 1-30</b>	71.1 (+ 1.3)	70.9 (+ 0.5)	73.9 (+ 3.5)	70.4
<b>July 1-31</b>	72.4 (- 1.8)	74.0 (- 0.2)	78.3 (+ 4.1)	74.2
<b>Aug 1-31</b>	71.5 (- 1.1)	75.2 (+ 2.4)	76.1 (+ 3.5)	72.6
<b>Sept. 1-30</b>	64.5 (- 1.6)	64.1 (- 2.2)	70.5 (+ 4.4)	66.1

## **Fungicide Label Change --- Sweeping changes in chlorothalonil labels.**

Recently chlorothalonil has gone through the R.E.D. (Re-registration Eligibility Document) process. EPA uses this process to review from time to time whether a pesticide should be allowed to retain its registration. This is a comprehensive review and may require extensive addition tests and data.

After this review, the following label changes were made to ALL chlorothalonil products and apply to all manufactures. The limits to maximum use per acre use per year is an accumulation of all chlorothalonil products. All applications of chlorothalonil need to be added together regardless of the manufacturer to calculate the amount applied to an area. If there are any questions read and follow the label on the product. Old product can be use in accordance with the label on the package.

### **chlorothalonil label changes and restrictions:**

Seasonal max:

- 73 lbs active ingredient /A/season on greens (89 lb Daconil Ultrex)
- 52lbs active ingredient /A/season on tees (63 lb Daconil Ultrex)
- 26 lbs active ingredient /A/season on fairways (32 lb Daconil Ultrex)

Maximum individual rate:

- A limite of one single application at a rate greater than 7.3 lbs active ingredient /A / season is allowed for fairways, sod frams, commercial lawns, parks, athletic fields and recreational lawns. (8.8 lbs Daconil Ultrex/A )
- A limite of two applications at a rate greater than 11.3 lbs active ingredient /A / season is allowed for golf course greens and tees. (14 lbs Daconil Ultrex/A )
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Minimum spray interval:

- 7 days (14 days at the 14 lb/A rate)

Site restrictions:

- **Can NOT be used on residential lawns.**

Remember to read and follow the label on all products.

**Fungicides evaluated for control of dollar spot in 2002.**

The test was conducted at The OSU Turfgrass Research Center, Columbus, OH on a stand of creeping bentgrass established 1997. Mowing height was 0.19", clippings were removed and the area was irrigated as needed. Fertilizer was applied with 18-4-18 in May (0.5 lb N/1000 sq ft). The soil was Crosby B silt loam, pH 7.3. Individual plots measured 3 ft x 5 ft, and were arranged in a randomized complete block design with three replications. Treatments were applied with a hand-held, CO<sub>2</sub>-powered boom sprayer, 6503 TeeJet nozzles, 40 psi, water volume was 2.0 gal/1000 sq ft. Treatments were started on June 11 with the last application made September 24. Due to above normal temperatures conditions were not conducive for dollar spot until late summer and fall. The experimental area was also inoculated with millet seed inoculum in late Aug. **No fungicide resistance to dollar spot is known at the site.**

Many treatments gave excellent control. Honor 50 WG 0.2 oz 14 days, Emerald 70 WG 0.13 oz 14 days, Emerald 70 WG 0.18 oz 28 days, Propiconazole Pro 14.3 ME 2.0 fl oz 14 days, T methyl Pro 4.5 F and 50WP at 1.0 fl oz and 2.0 oz 14 days, Banner MAXX 1.3 MEC 1.0 fl oz 14 days, Banner MAXX 1.3 MEC 1.0 fl oz 21 days, Daconil Ultrex 82.5 WDG 1.6 oz and 3.2 oz 7 days, 3336 50 WP 2.0 oz 14 days, Chipco 26GT 2SC 4.0 fl oz 14 days, and MANhandle T & O WP 10.0 oz 21 days all demonstrated excellent disease management.

**Table 2. Effects of Fungicide Products, Formulations, Rates, and Timing on Creeping Bentgrass Dollar Spot Incidence.**

Treatment and rate per 1000 sq ft	Application interval (day)	% plot area blighted by Dollar Spot				
		28 Aug	10 Sep	16 Sep	24 Sept	01 Oct
Untreated.....	-	2.33	10.00	13.67	11.00	18.33
Insignia 20 WG 0.9 oz.....	14	0.00	0.67	1.33	0.67	2.33
Heritage 50 WP 0.4 oz.....	14	0.00	1.00	2.33	3.00	7.67
Emerald 70 WG 0.13 oz. <sup>z</sup>						
Insignia 20 WG 0.9 oz.....	14	0.00	0.00	1.00	0.33	1.00
Honor 50 WG 0.2 oz.....	14	0.00	0.00	0.00	0.00	0.00
Honor 50 WG 0.2 oz.....	28	0.00	0.00	0.33	0.00	0.00
Emerald 70 WG 0.13 oz.....	14	0.00	0.00	0.00	0.00	0.00
Emerald 70 WG 0.18 oz.....	21	0.00	0.00	0.00	0.33	0.00
Emerald 70 WG 0.18 oz.....	28	0.00	0.00	0.00	0.00	0.00
Propiconazole Pro 14.3 ME 1.0 fl oz.....	14	0.00	0.33	4.00	1.33	0.00
Propiconazole Pro 14.3 ME 2.0 fl oz.....	14	0.00	0.00	0.00	0.00	0.00
T methyl Pro 4.5 F 2.0 fl oz.....	14	0.00	0.00	0.00	0.00	0.00
T methyl Pro 4.5 F 1.0 fl oz.....	14	0.00	0.00	0.00	0.00	0.00

Treatment and rate per 1000 sq ft	Application interval (day)	% plot area blighted by Dollar Spot				
		28 Aug	10 Sep	16 Sep	24 Sept	01 Oct
T methyl Pro 50 WP 2.0 fl oz.....	14	0.00	0.00	0.00	0.33	0.00
T methyl Pro 50 WP 1.0 fl oz.....	14	0.00	0.00	0.00	0.33	0.33
Dow Rotation <sup>y</sup> .....	14	0.00	0.00	0.00	0.67	2.67
Daconil Ultrex 82.5 WDG 3.2 oz <sup>v</sup>						
Medallion 50 WP 0.33 oz						
Banner MAXX 1.3 MEC 1.0 fl oz						
Heritage 50 WP 0.2 oz.....	14	0.00	0.00	0.00	0.00	0.67
Banner MAXX 1.3 MEC 2.0 fl oz.....	21	0.00	0.00	0.00	0.00	0.00
Banner MAXX 1.3 MEC 1.0 fl oz.....	14	0.00	0.00	0.00	0.00	0.00
Medallion 50 WP 0.33 oz.....	14	0.00	0.00	1.33	0.00	0.67
Heritage 50 WP 0.2 oz.....	14	0.67	4.67	6.00	10.00	24.67
Daconil Ultrex 82.5 WDG 3.2 oz.....	14	0.00	0.00	0.00	0.00	0.67
Banner MAXX 1.3 MEC 1.0 fl oz +						
Medallion 50 WP 0.33 oz.....	14	0.00	0.00	0.33	0.33	0.00
Banner MAXX 1.3 MEC 1.0 fl oz +						
Heritage 50 WP 0.2 oz.....	14	0.00	0.00	0.00	0.00	0.00
Banner MAXX 1.3 MEC 1.0 fl oz +						
Daconil Ultrex 82.5 WDG 3.2 oz.....	14	0.00	0.00	0.00	0.00	0.00
Heritage 50 WP 0.2 oz <sup>z</sup>						
Daconil Ultrex 82.5 WDG 3.2 oz.....	14	0.00	0.67	2.00	1.00	0.33
Medallion 50 WP 0.33 oz <sup>z</sup>						
Daconil Ultrex 82.5 WDG 3.2 oz.....	14	0.00	0.00	1.33	1.00	1.67
Spectro 90 WDG 4.0 oz.....	14	0.00	0.00	1.33	0.67	0.33
Heritage 50 WP 0.4 oz.....	28	0.33	1.33	5.67	7.33	6.33
Banner MAXX 1.3 MEC 1.0 fl oz.....	21	0.00	0.00	0.00	0.00	0.33
Banner MAXX 1.3 MEC 0.5 fl oz.....	14	0.00	0.00	0.67	0.00	0.00
Daconil Ultrex 82.5 WDG 3.2 oz.....	7	0.00	0.00	0.00	0.00	0.00
Daconil Ultrex 82.5 WDG 1.6 oz.....	7	0.00	0.00	0.00	0.00	2.00
Chipco 26GT 2SC 4.0 fl oz.....	14	0.00	0.00	0.33	0.00	0.33
Zero Tol 12.0 fl oz.....	7	0.67	1.67	5.00	9.33	16.67
Fertilizer (18-3-18) 44.4 oz.....	14	0.00	1.00	3.00	3.67	6.67
Iprodione PRO 2 SC 4.0 fl oz.....	14	0.00	0.00	0.67	0.33	0.33
Clearys 3336 50 WP 2.0 oz.....	14	0.00	0.00	0.00	0.00	0.00
MANhandle T & O WP 10.0 oz.....	21	0.00	0.00	0.00	0.00	0.33

Treatment and rate per 1000 sq ft	Application interval (day)	% plot area blighted by Dollar Spot				
		28 Aug	10 Sep	16 Sep	24 Sept	01 Oct
<b>LSD<sub>0.05</sub></b>		0.99	4.19	6.01	4.66	9.74

<sup>z</sup> Rotate between the materials on a 14 day interval.

<sup>y</sup> Dow rotation 1. Eagle 40SP 0.6 oz, then Fore 75WG 6.0 oz, then Eagle 40SP 0.6 oz, then Eagle 40SP 0.6 oz, then ProStar 70 WG 1.5 oz, then Fore 75WG 6.0 oz, then Chipco 26GT 2SC 4 fl oz, each at a 14 day interval.

<sup>v</sup> Rotate thorough the materials on a 14 day interval